Technische Universität München
Chair for Network Architectures and Services
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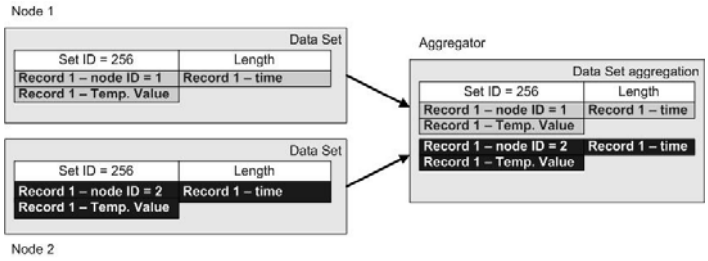
MA / BA-Thesis / SEP

Data Aggregation using tinyIPFIX

Motivation

Today, Wireless Sensor Networks (WSNs) can be found in different application areas. Due to application requirements data must be measured in real-time and analysed respectively. Thus, a big data volume occurs within the WSN. WSN components itself have very limited resources such as energy or computational capacities. Those resources should be used wisely for saving reasons. The most resources are needed for data transmission which should be reduced. One possibility is to pre-analyse the data on the nodes directly. This idea calls for data aggregation to reduce the data volume, the data transmission and save resources.



Topic Description

Currently we are working with IRIS motes from Crossbow Inc. and have implemented an efficient data transmission protocol called tinyIPFIX. This protocol works with a special packet structure which can be used for data aggregation. Data aggregation can be done in different ways which depend on the application scenario:

1. Measurement aggregation in only one packet
2. Measurement pre-analysis within the WSN before transmission

In the first phase of this thesis different existing approaches such as Secure Information Aggregation (SIA), Tiny AGgregation service (TAG) and Adaptive Application Independent Data Aggregation (AIDA) should be analysed and compared with each other.
In the next step an aggregation protocol based on the existing tinyIPFIX implementation should be developed and evaluated corresponding to a Home Network scenario.

Requirements

- Interest in sensor networks and communication protocols
- Basic knowledge in network communication
- Programming knowledge in C/C++ and Java could be helpful

Key words

Wireless Sensor Networks, Aggregation Protocols, Data Transmission

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